SHOUT
SHARE
IT

Historic, archived document

Do not assume content reflects current scientific knowledge, policies, or practices.

UNITED STATES DEPARTMENT OF AGRICULTURE

BULLETIN No. 573

Joint Contribution from the Bureau of Plant Industry, WM. A. TAYLOR, Chief, and the Bureau of Animal Industry A. D. MELVIN, Chief

Washington, D. C. ▼ August 4, 1917

THE SHEEP INDUSTRY ON THE MINIDOKA RECLAMATION PROJECT.[1]

By E. F. RINEHART, *Agriculturist, Demonstrations on Reclamation Projects, Bureau of Plant Industry.*

CONTENTS.

	Page.
Importance of sheep production on Government reclamation projects	1
Agricultural conditions on the Minidoka project	2
History and present status of the sheep industry on the Minidoka project	4
Relationship of farm sheep production to the range sheep industry	4
Sheep population of the Minidoka project	5
Agricultural diversity of farms producing sheep	6
Methods of sheep management	6
Relationship of sheep production to other industries on the farm	6
Foundation stock	7
Breeding practices	11
Methods of sheep management—Continued.	
Lambing	12
Docking and castrating	13
Weaning	14
Feeds and feeding	15
Buildings and equipment	18
Diseases, pests, and minor ailments	20
Shearing	23
Marketing	24
Future development of the industry	25
Conservative practices	26
Relationship of sheep production to other industries	26
Community cooperation	27
Stabilizing the industry	27

IMPORTANCE OF SHEEP PRODUCTION ON GOVERNMENT RECLAMATION PROJECTS.

Two of the leading factors influencing the development of agriculture on the Government reclamation projects are the isolated location of these irrigated regions and the local conditions necessitating or favoring the production of forage and grain crops, which ordinarily will not bear the cost of transportation to the large consuming centers. It follows that the development of these irrigated lands requires the establishment of live-stock industries, in which

[1] This bulletin has been prepared under the direction of Mr. F. D. Farrell, Agriculturist in Charge of the Office of Demonstrations on Reclamation Projects of the Bureau of Plant Industry, as a part of the work of that office in the development of agricultural industries on the Government reclamation projects. That part of this work which relates to live-stock production is conducted in cooperation with the Bureau of Animal Industry. The suggestions made in this bulletin, while based primarily on the results of observations on the Minidoka Reclamation Project, are applicable to several other irrigation projects in the northwestern United States having similar climatic and agricultural conditions.

the chief crops produced can be utilized locally and the products marketed at a profit. The failure in recent years of live-stock production in the United States to keep pace with the rapidly increasing demand for live-stock products has resulted in high prices for these commodities, and this has intensified the irrigation farmer's interest in animal industries.

The national deficiency of live-stock products has been more acute with respect to sheep than any other class of farm animals. The strong demand for wool and mutton, together with a decreasing national supply, has resulted in extremely high prices during recent years. These facts have directed the attention of an increasing number of irrigation farmers to the possibilities of sheep production on irrigated lands.

The interest in sheep production has been particularly noticeable on the Minidoka Reclamation Project. Since the writer was stationed on the project in October, 1914, there has been a rapidly increasing demand for information regarding methods of sheep production, and the local sheep industry has experienced steady development. During the past two years, special attention has been paid to sheep production, and information has been secured bearing on the problems with which irrigation farmers are confronted in the development of the industry.

This bulletin has been prepared with special reference to the Minidoka project, but it should also be of value to farmers interested in sheep production on other reclamation projects where the conditions are similar. In order to give a general understanding of the conditions under which sheep are produced on the Minidoka project, the more important climatic and agricultural features of the district are briefly described.

AGRICULTURAL CONDITIONS ON THE MINIDOKA PROJECT.

The Minidoka Reclamation Project is situated in the Snake River Valley of Idaho, 70 miles west of the town of Pocatello. The project contains approximately 120,000 acres, somewhat more than half of which lies on the north side of the river under the gravity irrigation system, the remainder lying on the south side being irrigated by pumping. Surrounding the project on all sides are wide sagebrush plains, large areas of which are now being settled and reclaimed by dry farmers. On the north lies an area approximately 90 miles wide including sagebrush plains, a small irrigated valley, and a mountainous range area, beyond which the Sawtooth National Forest is located. To the south there is an area of public land which is being taken up by dry farmers, and beyond this is a mountainous range area, including the Minidoka National Forest. Cattle and sheep are grazed in the mountainous ranges during the summer. On the

sagebrush plains the grass is good from April to June, and again after the fall rains, usually from October to December.

The average elevation of the irrigable area of the project is 4,225 feet. The annual precipitation averages 14 inches, most of which occurs during the winter months. The annual range of temperature is from −20° to 100° F. The irrigation season extends from April 1 to October 31. The principal soils are a heavy clay loam, a sandy loam, and a sand, approximately 11 per cent of the project being made up of sandy soils. The farm unit in most instances is 80 acres. A few farms are smaller than this and a few somewhat larger.

As is generally true in the reclamation of arid lands by irrigation, alfalfa is one of the principal crops produced on the Minidoka project. This crop is important both because its growth increases the productivity of the soil and because of its value in live-stock production. Other important crops grown on the project are grains, sugar beets, and potatoes. In 1916 crops were harvested from approximately 80,000 acres on 1,849 farms. Alfalfa hay was produced on 37,300 acres and clover hay on 880 acres, the areas devoted to these two crops being about 47 per cent of the total cropped area of the project. About 20,000 acres, or 25 per cent of the cropped area, were devoted to grain crops, chiefly wheat, oats, and barley. These hay and grain crops in ordinary times can be utilized most advantageously when fed to live stock. The 8,666 acres of pasture on the project in 1916, together with the acreage in alfalfa and grains, amounted to more than 80 per cent of the total cropped acreage. Thus, the importance of establishing live-stock industries on the project is evident. Not only have the direct results of live-stock farming proved profitable, but the benefits in the way of soil improvement have been marked. Almost without exception the farms that produced maximum crop returns in 1916 are those where live stock is kept and fed. There are individual instances of crop-yield increases as great as 60 per cent resulting from a single application of manure to the land.

Because of these facts the interest in all kinds of live stock is great, and the live-stock population has increased rapidly during recent years. Table I, which has been compiled from data furnished by the United States Reclamation Service, shows the number of live stock on the project at the beginning and at the close of the year 1916.

Owing to the unusually high prices of grain it was found profitable to sell spring pigs during the summer of 1916 as stock hogs and serum hogs. For this reason, the swine population decreased materially during the year, and a large proportion of the hogs on the farms in December were breeding stock.

TABLE I.—*Live stock on farms on the Minidoka Reclamation Project in 1916.*

Item.	Jan. 1.	Dec. 31.	Increase.
			Per cent.
Horses	6,557	7,174	9.5
Dairy cattle	6,902	7,314	6.0
Beef cattle	1,220	2,304	89.0
Hogs	42,933	23,610	−46.2
Sheep	16,748	21,029	24.0

All kinds of live stock are proving profitable on the project, and sheep are becoming particularly popular. The high altitude and the dry climate are well adapted to the production of sheep, which in this section have been remarkably free from internal parasites and diseases. Sheep have been found useful in checking the growth of weeds on ditch banks and in fence rows, and they are also relatively easy to care for, especially during the irrigation season when the farmers are busy with other work.

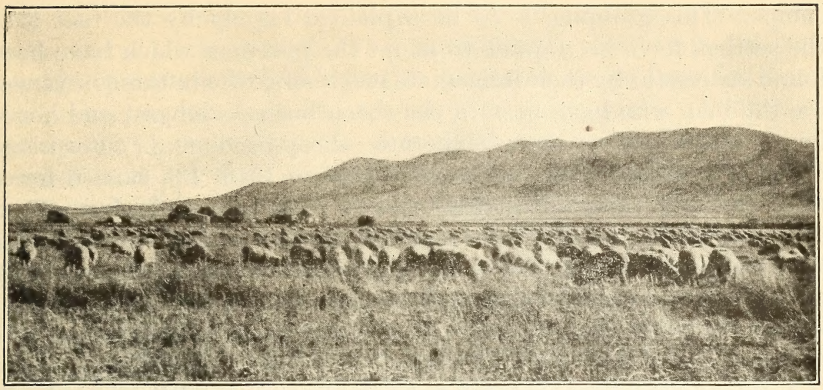
HISTORY AND PRESENT STATUS OF THE SHEEP INDUSTRY ON THE MINIDOKA PROJECT.

RELATIONSHIP OF FARM SHEEP PRODUCTION TO THE RANGE SHEEP INDUSTRY.

In the early years of the development of the Minidoka project sheep were kept on very few farms. As the project produced large quantities of alfalfa hay and was situated in the midst of extensive grazing areas, it soon became the winter feeding ground of large numbers of range stock, chiefly sheep. The number of sheep wintered on the project during recent years has varied from 60,000 to 195,000. Permanent headquarters for range sheepmen have been established on a number of farms, where lambing sheds have been built and large quantities of hay fed. The range sheep are used extensively in cleaning up hay and grain fields after harvest, as shown in figure 1.

For a long time there was a belief that irrigation farmers could not compete with the men on the ranges in the production of either wool or mutton. The fallacy of this belief, however, has long been shown by successful farm sheep producers. Because of the hazards of the range sheep business and of the difficulties resulting from settlement by dry farmers of areas formerly used as grazing lands, the rangemen in many sections are coming to favor sheep production on farms. As the difficulties of range sheep production increase and with increasing demands for wool and mutton, the possibilities for producing sheep on irrigated farms should become increasingly attractive.

Under certain conditions, particularly where irrigated pastures have not been successfully developed, the ewes from several different farms are sometimes combined into a cooperative band and sent



P1004RP

FIG. 1.—A band of sheep grazing on the aftermath in hay and grain fields on the Minidoka Reclamation Project. Range sheep are used extensively for this purpose and also to consume surplus alfalfa hay produced on the irrigated lands adjacent to the range country.

to the range under the care of a competent herder. Where a good summer range is available this is a desirable arrangement, especially when individual flocks include more than 100 head. It is believed, however, that this practice, while important to a comparatively small number of farmers, is not likely to be generally adopted. One important deterrent to extensive development in this direction is the lack of available range.

There are two features in which the range sheep industry has a definite relationship to the production of sheep on irrigated farms. These features relate to the farm production of pure-bred rams for use on the range and the use by small farmers of orphan and disowned lambs from range herds. Both of these features will be discussed more fully later.

SHEEP POPULATION OF THE MINIDOKA PROJECT.

The number of sheep kept on farms on the Minidoka project increased from 3,599 in 1911 to 21,029 in 1916. The highest number in any year previous to 1916 was 19,965, in 1913. During that year the prices of sheep advanced materially, and a large number of farmers on the project sold out, believing that they could restock their farms later at low prices. Since that time, however, the prices have continued to advance, and the sheep population of the project has increased but slowly. In 1916 the 21,029 sheep on the project were kept on 289 farms, the average number per farm being 72. If from the total number the few relatively large bands which are kept on the range a part of the time were eliminated, the average number per farm would be about 50. The farms where sheep are kept are fairly evenly distributed throughout the project, although there is a tendency for them to be grouped in the vicinity of lambing

camps. This grouping is to be explained largely by the fact that the settlers have been quick to adopt the practices which have been found successful by their immediate neighbors, who in these instances are the men who have been in the sheep business longest and hence have established rather elaborate sheep-producing enterprises. Of the 289 farms where sheep were kept in 1916, 133 carried fewer than 10 sheep each; 46 carried from 10 to 20 sheep; 49, from 20 to 50; 23, from 50 to 100; 28, from 100 to 200; and 10 carried more than 200 each. The flocks containing fewer than 10 head are chiefly those where a start is being made in the sheep industry.

AGRICULTURAL DIVERSITY OF FARMS PRODUCING SHEEP.

As a rule, the farms where sheep are kept are well improved and have a wide diversity of crops and live stock. Of the 289 farms keeping sheep in 1916, 263 also carried dairy cattle, the average number of dairy stock on these farms being eight head. A total of 253 of the farms carrying sheep also carried hogs, the average number of hogs being 27 head. Of the 289 farms carrying sheep, 61 carried an average of 11 head of beef cattle. A total of 270 of the sheep-producing farms produced alfalfa, 179 produced grain, 88 produced either beets or mangels, and 219 had irrigated pastures. The average areas per farm in these crops were 10 acres of pasture, 27 acres of alfalfa, 17 acres of grain, and 9 acres of root crops.

As the country is new, there are few definite or well-established systems to follow, as is the case in older communities. There is every reason to believe, however, that a diversity of industries on the farm on these irrigation projects is greatly to be desired, and it appears that the farmers producing sheep on the Minidoka project are gradually approaching a system of desirable diversity.

METHODS OF SHEEP MANAGEMENT.

RELATIONSHIP OF SHEEP PRODUCTION TO OTHER INDUSTRIES ON THE FARM.

The methods whereby sheep are produced on the Minidoka project fall into two classes—those practiced on the majority of sheep farms where the flocks are small and those practiced on a few farms which are either specialized sheep farms or where the major portion of the agricultural activity is directed toward the production of feed for range sheep during the winter. It is to be expected that most of the sheep growers on the project will continue to raise sheep in connection with other agricultural industries rather than as a specialty. Except in special cases, it is doubtful whether sheep should be made the major industry of a farm. On the average farm, a flock of from 20 to 50 ewes can be kept with advantage to the farm and with a profit to the owner. For those who wish to make more of a specialty of sheep production, a flock of from 60 to 100 head is a popular and

desirable size. Such a flock requires special pastures, winter feed yards, and a lambing shed. It is questionable whether in the long average of years it will be desirable to use an entire farm for sheep production, as has been the tendency in a few cases. A flock of 100 ewes will require on the average the entire production of 20 acres of land. A flock of 350 or 400 ewes would require the entire production of an improved 80-acre farm. With one of these large flocks there would be no inexpensive waste feeds and no by-products of other agricultural industries, which are so profitably utilized by sheep on farms where sheep production is not the exclusive industry. The importance of sheep in the utilization of waste materials should receive special emphasis. It is largely through such utilization that the economical production of sheep on irrigated farms is possible. It is important, therefore, that farmers who contemplate engaging in sheep production on these irrigated lands should carefully consider the relationship of sheep to other industries of the farm and should pay special attention to the utilization of waste materials. Of the 289 farms on the project carrying sheep in 1916, only 38 carried more than 100 head each. This indicates the general tendency to keep sheep in relatively small bands, and such a tendency is to be encouraged.

FOUNDATION STOCK.

Getting started.—There are various methods whereby a farmer can secure a start in the sheep industry on the Minidoka project. Experience here and elsewhere has led to the conclusion that for the inexperienced man the foundation stock should be grades. The successful production of pure-bred stock requires expert knowledge both in the selection of stock and in its management. It is also important to consider that the cost of starting with pure-bred ewes is much greater than that of starting with grade ewes. So far it has been possible for farmers on the project to secure a start in the sheep business by obtaining orphans and disowned lambs from range sheep camps on the project. These lambs usually may be had for the asking. There are numerous instances in which such lambs have been taken from the camps, fed cows' milk, carefully handled during the first few weeks of their lives, and thus become the origin of successful farm flocks. Good results are secured by feeding cows' milk from a bottle with a small rubber nipple attached. Lambs when obtaining their feed by natural methods receive their milk in small quantities at frequent intervals. This should be kept in mind in the early feeding of lambs secured from range bands. The milk should be clean and of uniform temperature, as determined by a thermometer. Farmers who are successful in raising lambs on bottles feed two or three tablespoonfuls of milk every two hours for the first few days and then

gradually increase the quantities of milk and the intervals between feedings. Where a number of lambs are fed from a few bottles, it is convenient to have the vessel holding the milk heated and carried in a receptacle containing hot water, which keeps the milk at the proper temperature, so that it is not too cold when the last few lambs are fed. For a large number of lambs a barrel or tank equipped with a number of rubber nipples at the base is very convenient.

Carelessness in any detail of feeding is likely to result in scours. The lambs should not be given too much. The temperature of the milk should be about 92° F. The bottles and nipples should be kept scrupulously clean. Scours are best overcome by boiling the milk for a few feeds after the trouble appears. Other common remedies successfully employed are the feeding of a small quantity of charred flour or a teaspoonful of lime water in the milk. For severe cases, a tablespoonful of castor oil is given. Boiled milk should not be fed continuously, as it causes constipation.

Breeds.—Because of the intimate relationship which has existed between the farm sheep industry on the project and sheep production on the adjacent ranges, the breeds grown on the project are those of the surrounding range. In this section the popular range ewes are grades of the C type Merino and the Rambouillet or the crossbreeds of a long-wool buck (Lincoln or Cotswold) and fine-wool ewes. Some range bands contain three-fourths or more of the long-wool blood. As a rule, however, the range ewe that is most popular is the one carrying from one-half to three-fourths of fine-wool blood and the remainder long-wool blood. While there are some differences of opinion among the rangemen, the method followed by most of them is to use Rambouillet and long-wool bucks to keep the desired proportion of fine-wool and long-wool blood in the range band. The ewe lambs from these matings are kept to replenish the flocks, while the males are marketed as wether lambs. For the ewes which are to produce mutton lambs, black-faced bucks are used, and the entire lamb crop, both male and female, is marketed, usually early in the season.

The difficulties of range sheep production have been so acute in recent years that only the more efficient of the range sheepmen have remained in the business. These men are usually progressive and quick to grasp opportunities for increasing their profits. One result of this is that the bucks now used are practically all pure-bred animals of the best quality obtainable. This has resulted in a strong demand for pure-bred bucks from the Minidoka project and has presented good opportunities to sheep growers on the project.

The production of registered sheep was started on the project by the establishment of a flock of pure-bred Hampshires in 1911. At that time sheepmen were beginning to realize the value of this large

black-faced breed as a first cross on the range ewes for the production of choice early-maturing mutton lambs. The Hampshire flock started at this time was selected and owned by an experienced sheepman, who was an expert judge of sheep; consequently, the flock ranked high as to both type and breeding. As most of the Hampshire flocks at present on the project have descended from this foundation stock, the Hampshires as a whole, both grade and pure bred, are of uniformly good quality. In 1912 several farm flocks of pure-bred and high-grade Lincolns and Cotswolds were established for the purpose of raising rams to sell to the range sheepmen. The farmers who started properly and gave their flocks good care and attention and have become well informed regarding sheep husbandry have been very successful. Their example is being followed by other enterprising farmers.

So far, the Rambouillet breed has not been popular among the farmers. The irrigation farmer quite properly has had in view mutton production as a first consideration. Consequently, mutton breeds—Lincolns, Cotswolds, Hampshires, and Shropshires—are the most popular at present. There is an excellent opportunity, however, for the establishment of pure-bred Rambouillet flocks, chiefly for the production of rams for use in range bands.

The 21,029 sheep on the project at the close of 1916 are classified in Table II, which shows the number of both grades and pure breds of each of the breeds represented on the project.

TABLE II.—*Breeds of sheep on the Minidoka Reclamation Project in 1916.*

Breed.	Number of—			Total.
	Pure breds.	Grades.	Unclassified.	
Hampshire	246	820	.....	1,066
Shropshire	0	106	.....	106
Cotswold	209	344	.....	553
Lincoln	300	3,353	.....	3,653
Rambouillet	40	444	.....	484
Delaine Merino	0	250	.....	250
Mixed breeds	.....	.....	14,917	14,917
Total	795	5,317	14,917	21,029

Of the crossbred or range type of sheep kept, there are some flocks that are being graded up. Others are bred so as to maintain the crossbred type, as it is popularly supposed that the ewes of this mixture are hardier and are better mothers than those of straight breeding. Other arguments advanced in favor of crossbreds are that the ewes of this type will yield more wool than the Down breeds and that if a good buck is used good mutton lambs will be produced. There is some justification for these arguments, but it is also true that these flocks can never attain the high standard of individual excellence

that is being reached by grading up through the use of well-selected, pure-bred rams of a chosen breed. With the exception of the case of a few men whose sheep production is carried on on the range as well as on the farms, it is believed that the continuous production of crossbreds is inadvisable.

Selection of ewes.—Summer or early fall is the best time for selecting a flock. At this time the breeders are cutting down their flocks for the winter. From many of the range bands good ewes can be purchased at reasonable prices. In selecting, it is important that the desirable type be borne in mind. Essential points indicating good breeding are a feminine head; deep body with good spring of ribs; a wide, level back, carrying out well on the rump; a good fleece, covering the body uniformly; sound teeth; and good udders. Common mistakes made in bands otherwise well selected are the failure to determine the age by looking at the teeth and the overlooking of barren ewes. The age is easily determined by examining the front teeth. Lambs, up to the time of the first shearing, are easily distinguished, usually by general appearance; otherwise by their milk teeth. About the time of the first shearing, the middle pair of milk teeth are replaced by permanent teeth, which are practically twice as broad as the milk teeth. Sheep with four permanent teeth are designated as 2-year-olds, those with six teeth as 3-year-olds, and a full set of eight permanent teeth appears when the sheep is 4 years old. At varying ages, depending on the breed, care, and individuality of the mature sheep, the teeth become spread, and the sheep is called a "spread-mouth;" or a part of the teeth may be lost, and the sheep is called a "broken-mouth;" or all the teeth may be gone, in which case the sheep is called a "gummer." Careful attention should be paid to these points when ewes are being selected.

Selection of the ram.—Although most of the farm flocks on the project are grades, the general custom is to breed to a registered ram. Examples of improvement and increased value brought about in range bands by the use of good pure-bred rams are so numerous and so obvious that practically all the farmers breed their ewes to pure-bred males. Generally speaking, grade rams are used only when it is impossible to secure a satisfactory pure bred. The good results of using pure-bred rams on the farms are becoming very marked. As the ram is "more than half the flock," extra care should be used in his selection. Perhaps the most common mistake made in this connection is to overlook the fact that a pedigree in itself is not an absolute guarantee of individual excellence. Purity of breeding, as indicated by the pedigree, is important, and no ram without it should be selected; but in addition to good breeding, the ram should have the desirable individual characteristics of his breed. He should be masculine, healthy, and vigorous. He

should have a wide, deep chest, a good spring of rib, good bone, and carry out uniformly. The fact that all undesirable characteristics of the ram may influence the entire lamb crop should not be lost sight of, but should prompt the farmer to exercise great care to see that the individual selected is uniformly good in all respects.

BREEDING PRACTICES.

As the climatic and other conditions of the Minidoka project are favorable to the production of early lambs, it is the common practice to breed for February and early March lambing. As the gestation period of ewes is 147 days, February and early March lambing requires that the ewes be bred in September or early October. It is seldom necessary in this locality that the ewes be "flushed"—fed heavily in order to make them come in heat.

Breeding mature ewes.—For the small farm flock of 10 to 25 ewes a ram lamb may be used. In the flocks containing 25 to 60 ewes it is necessary to use an older ram. It is the general practice to allow bucks to run with the ewes during the breeding period, but where a large number of ewes are to be bred to one ram, he is turned with the ewes only in the morning and in the evening. Some flockmasters make a practice of marking the ewe when she is bred, the mark indicating the time of breeding. The same mark can be used throughout the breeding season, provided its location is changed so as to indicate the week during which the ewe was bred. Such marking is convenient at lambing time, when it is desirable to isolate the ewes which are about to lamb. A further use of marking is that, in case the ram is not a sure breeder, it enables the flockmaster to determine early in the season which ewes have failed to conceive. Some sheep growers paint the breast of the ram with a paint that ultimately fades from the wool. By a change in color of the paint used each week the approximate time of lambing is indicated.

Breeding ewe lambs.—Owing to the present demand for sheep and the consequent desire on the part of flockmasters to see their flocks increase rapidly, the ewe lambs are sometimes bred. This practice is confined mostly to the Hampshire breed, but it is followed to some extent with the long wools as well. Usually the lambing percentage obtained with ewe lambs ranges from 50 to 60. Ewes which have been bred as lambs are not as large when they are yearlings as ewes which have not been bred early. The difference in size is usually small, however, by the time the ewes are 2 years old. The breeding of ewe lambs can be practiced only in those flocks where the lambs come early and where growth is rapid from the beginning. As size in ewes is a very important consideration, the breeding of ewe lambs is to be regarded as an undesirable practice.

Care after breeding.—After breeding, the ewes ordinarily require no special care or feed until winter. If the waste feeds in the fields are sufficient, there is no better practice than to allow the ewes to run in the fields until snow falls. It is important to remember, however, that the effect of inadequate feed may not be readily observed at this season because of the long fleece on the ewes. Methods of feeding ewes during the winter are further discussed in the chapter on feeds and feeding.

Care of the ram.—In summer, a small separate pasture is usually provided for the ram. The farm orchard is a convenient and satisfactory place for this purpose. During the breeding season, if there are a large number of ewes to be bred to one ram, he is kept by himself during the day and is fed oats and bran in addition to hay or pasture. The care of the ram in winter is much the same as that for ewes, except that only a few flockmasters feed roots to the ram, and these only sparingly, whereas a large number of sheepmen feed roots to ewes.

LAMBING.

Lambing ordinarily occurs in February or early in March. A few days before lambing the ewes are placed in a sheltered yard or shed. The grain rations are greatly reduced. In some cases, when the ewe shows signs of lambing within a day or two, she is placed in a pen by herself. If there are any loose, dirty locks of wool around her udder they should be removed. The ewe is carefully watched but not disturbed. If she has had plenty of exercise and has been well cared for, little trouble should be experienced in lambing.

The lambing period is one of the most important of the year, and successful lambing requires almost constant attention by the herdsman. Occasionally it is necessary to assist the ewe because of a difficult presentation of the lamb, but the chief need is to assist the weak lambs immediately after birth. If the lamb is chilled, it is taken to a room where a fire is kept burning and warmed by blankets and rubbing. A common practice is to dip the chilled lamb into a pail of water as hot as the hand can bear. The lamb is then carefully dried, given a few spoonfuls of its mother's milk, and returned to the ewe. The use of warm blankets is to be preferred to dipping in hot water. Milk, freshly drawn from the mother ewe, should always be given a weak lamb as soon as possible. A tub or half barrel, bedded with straw and containing a jug of hot water covered with a blanket, is a good place for keeping the lambs while they are being warmed and fed. As soon as possible, the lamb should be returned to its mother.

In many cases, particularly with young ewes and those which have been fed a ration of hay only, there is difficulty in inducing the ewe to allow the lamb to nurse. In such a case, the ewe should be held

and the lamb assisted. If the ewe persists in fighting the lamb, it may be necessary to tie her with a small halter or confine her in a stanchion made by driving two stakes in the ground. Some of the permanent sheds on the project have small stanchions provided in the slats of the hayrack along the wall. It is customary to leave the ewe and her lamb in the pen two or three days, until they get to know each other thoroughly and the lamb becomes strong and active. During this period the ewe should be fed but little grain. After the first few days the ewe and the lamb are turned into the larger pens with other ewes and lambs of the same age, or if the weather is favorable they are turned into a dry, sunny, wind-protected yard. A few days later they may be turned into the larger yard with the band.

Special care should be exercised in keeping the lambing sheds and yards clean. It is not sufficient that the lambing quarters be given the customary one cleaning a year. Each pen should be thoroughly cleaned and disinfected before the ewe and her lamb are placed in it. This is a necessary safeguard to the health of the young lamb, particularly with reference to white scours, from which serious losses sometimes result.

DOCKING AND CASTRATING.

The lambs are docked and castrated when they are from one to two weeks old. The work is best done in the morning of a clear, bright day. While it is the general practice to castrate and dock at the same time, it is better to do the docking a few days after the castrating, as the shock of two simultaneous operations is severe and is likely to give the lambs a serious setback. Docking is usually done with a sharp knife. From the results secured by the use of hot docking-irons and pinchers in certain sections of Idaho, it appears that this method should be adopted by sheep growers on the Minidoka project. It has been ascertained that lambs docked with a hot

P755RP

FIG. 2.—Part of a farm flock of sheep on irrigated pasture on the Minidoka Reclamation Project. From 6 to 10 ewes and their lambs can be carried through the summer on an acre of this pasture.

iron average about a pound more in weight a week after docking than lambs which have been docked by the ordinary method and have lost considerable blood. Castrating is done by cutting off the lower third of the scrotum and pulling out the testicles, cords and all.

WEANING.

In the pure-bred flocks, or where it is desired to keep the ewe lambs for breeding purposes or for the fall and winter markets, weaning takes place when the lambs are 4 to 5 months old. By separating the lambs from the band and allowing them the run of good pasture, they do as well as if allowed to run with the ewes all summer. In some instances they do better. Moreover, if the ewes are allowed a summer's rest, they will breed earlier and produce a higher percentage of lambs.

A common method of weaning lambs on irrigated pasture is to leave the lambs in the same field but to remove the ewes to poor feed out of sight and hearing of the lambs. At the same time the ram lambs should be separated from the ewe lambs. A few flockmasters wean the lambs gradually, allowing them to be with the ewes for short periods twice each day. This method has some advantages, the chief of which is that the milk of the ewes dries up gradually. However, the practice can be continued too long, two or three days probably being the best time. Whatever method of weaning is pursued, it is necessary to watch the ewes carefully and to draw the milk from the udder in case of congestion.

P758RP

FIG. 3.—Sheep grazing on a canal bank on the Minidoka Reclamation Project in August, 1916. Used in this way, sheep are helpful in eradicating weed growth, and at the same time they produce mutton and wool at small cost.

P926RP

FIG. 4.—A farm flock of sheep on an alfalfa field in winter, eating mangels fed whole. The feeding of roots in this manner is a common practice on the Minidoka Reclamation Project.

FEEDS AND FEEDING.

The feeds for sheep on the Minidoka project may be divided into three general classes: Pastures, waste products, and the feeds used in late fall and winter. While there are some variations in the periods of utilizing the different feeds, in general the irrigated pastures are the basis of summer feeding; the waste products are utilized in late summer and early fall, and hay and grain are fed in the winter.

Pasturing.—Irrigated pastures are becoming increasingly popular among sheep growers on the project. Of the 289 farms carrying sheep in 1916, 219 contained pasture, the average pasture area being 10 acres per farm. A part of a farm flock on irrigated pasture is shown in figure 2. There is a variety of pasture mixtures in use. Nearly every pasture, however, contains bluegrass and white clover. Perhaps most of the pastures at present in use were originally seeded to the mixture recommended by the Idaho Agricultural Experiment Station,[1] containing the following, at the rates of seeding in pounds per acre indicated: Kentucky bluegrass, 8 pounds; orchard grass, 5 pounds; smooth brome-grass, 5 pounds; meadow fescue, 4 pounds; timothy, 4 pounds; and white clover, 2 pounds. The total quantity of seed in this mixture is 28 pounds per acre. These special pasture mixtures, which are in general use on the Minidoka project, provide rich feed and are ready early in the season. On these pastures the lambs make such rapid growth that they are ready for market early in June. In 1916, the first shipment of spring lambs was made on May 27, when two carloads left the town of Rupert. These lambs were bought to weigh between 65 and 80 pounds. The best lot in the shipment was a flock of 74, averaging 73½ pounds each at the loading station. These lambs had been born during the latter part

[1] Welch, J. S. Grass pastures for irrigated lands. Idaho Agr. Exp. Sta. Bull. 80, 15 p., illus. 1914.

of February and had received no grain. Their mothers, however, had received good feed and excellent care. Where the pasture has been well started and properly cared for, on the heavier soils of the project as many as 10 ewes and their lambs are carried on 1 acre for the entire season. The average pastures, however, will not carry so many stock, seven ewes and their lambs being a common carrying capacity. The best results are secured by having the pasture divided into three parts, so that the stock are off the pasture during irrigation and for some time afterwards. Neither horses nor hogs should be allowed in the pasture with the sheep, but excellent results are secured where sheep and cattle graze together. Pure drinking water and salt should be provided at all times. It is desirable, also, that shade be provided in each pasture, as this adds to the comfort and thrift of the animals. When, as the result of overstocking or unfavorable growing weather, the pasture becomes temporarily overgrazed, it should be supplemented by feeding some grain to the lambs. In some instances the ewes become too fat on irrigated pasture, so that they do not breed satisfactorily. This difficulty can be eliminated by turning the ewes into stubble fields or otherwise providing a relatively scanty feed for a short time.

There are occasionally instances in which it seems advisable to pasture clover and alfalfa, although the practice is somewhat hazardous on account of bloat. There are many theories as to the best method of preventing bloat. The safest practice appears to be to have the sheep well filled with hay or other feed before they are turned on the alfalfa and clover pasture. Some farmers maintain that if no shade is provided bloat is less likely to occur. They argue that when shade is provided the sheep remain in the shade too long on hot days and then consume large quantities of succulent feed in a

P932RP

FIG. 5.—Typical shed and winter yards for a farm flock of sheep on the Minidoka Reclamation Project. A common and satisfactory practice, is to have the closed shed used for lambing face to the south, and the open shed, for general uses, face the east.

P923RP

FIG. 6.—A popular type of lambing shed on the Minidoka Reclamation Project, having a large sliding door at each end and large open windows on the south side. Feeding racks of the box type are illustrated at the left, and the winter yards are shown in the foreground.

short time. The use of alfalfa and clover as sheep pasture must be regarded as dangerous. Experienced sheepmen make the statement that unless a flockmaster is willing to risk a loss of 10 per cent he should not attempt to pasture his flock on alfalfa during the entire season. A few sheepmen cut and cock the third cutting of alfalfa and then turn the sheep into the field. So far, no unfavorable results have been reported.

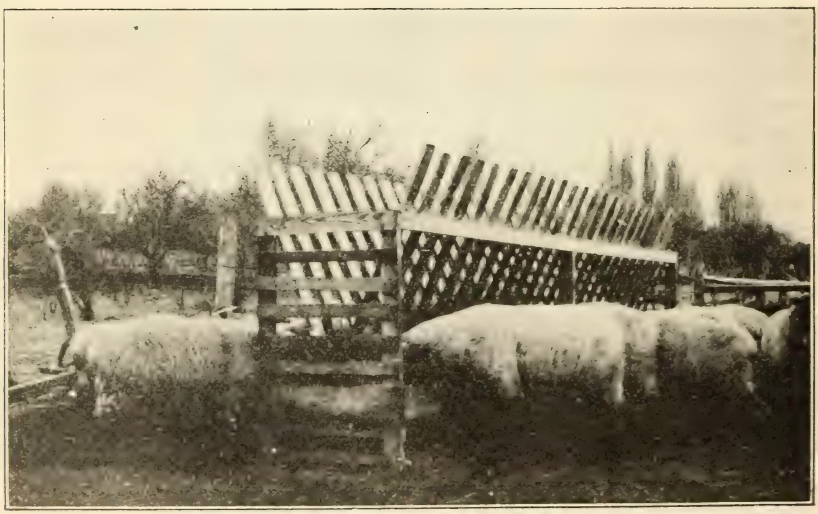
Utilization of waste products.—The sheep is a very efficient animal in utilizing certain waste products on the irrigated farm. On all these farms there is much waste feed, including weeds and native grasses on ditch banks and in fence rows, the waste hay and aftermath in hay fields, grain and weeds in stubble fields, and the beet tops left after the sugar-beet harvest. As the growth of the irrigated pasture crops begins to diminish, these waste materials begin to become available, so that the sheep are gradually moved from the pastures to the fields, ditch banks, etc., where, in ordinary seasons, they are well fed until December. The sheep oftentimes can be used for temporary periods in summer in cleaning up weeds from ditch banks (as illustrated in figure 3) and other similar places on and about the farm. By these methods, the sheep assist in keeping down undesirable vegetative growth and in removing waste material, at the same time producing valuable mutton and wool.

Late fall and winter feeding.—After the first snowfall, which usually comes in December, it is necessary to feed the flock. It is a desirable practice to allow the sheep the run of the fields during the winter feeding period so as to avoid the difficulties resulting from the lack of exercise. Approximately half the flockmasters on the project feed only hay during the winter. About one-fourth of the sheep growers produce and feed mangels, beets, or beet pulp, and about one-fourth feed

a grain ration. A few flockmasters feed both roots and grain. There are no silos on the project at present, but elsewhere in southern Idaho corn silage is fed to the breeding flocks with excellent results. As it is popularly believed that the excessive feeding of roots may result in the productin of soft, flabby lambs, the quantity of roots fed during the winter is not large, from 2 to 4 pounds per sheep being the daily allowance. Roots commonly are fed whole and in the field, as illustrated in figure 4. In some instances where grain is used, grain feeding begins a month or six weeks before lambing. Other flockmasters do not feed grain until after lambing time. There is, perhaps, no better grain ration to supplement alfalfa than a mixture consisting of two parts oats and one part bran. A half pound to a pound of this mixture per head each day is sufficient. Unthrashed sheaf oats is a popular and desirable feed to use in connection with alfalfa. The practice of feeding some supplement with alfalfa is rapidly gaining in popularity. Where such feeding is not practiced, it is frequently found that young ewes refuse to own their lambs and that neither young nor old ewes produce sufficient milk to feed the lambs properly. It is important to provide the flock with fresh water and salt at all times. The practice of forcing the flocks to drink from stagnant ponds or dirty drinking troughs is to be condemned.

BUILDINGS AND EQUIPMENT.

Except at lambing time, shelter is not absolutely necessary, although open sheds and windbreaks are desirable, as there is need for protection against west winds. A dry yard with an open shed or windbreak or with an open shed and a closed lambing shed joined



P927RP

FIG. 7.—A popular type of combination hay and grain rack for feeding sheep.

together in the shape of an L, so as to give protection from the north and west winds, is desirable. A typical L-shaped shed is illustrated in figure 5.

Lambing sheds.—There are several types of good lambing sheds in use on the project. One of the most popular is a shed 18 or 20 feet wide, extending east and west. This shed is 5 feet high at the eaves on the north and 6 feet high on the south. Large open windows, which can be closed with muslin or canvas, are placed in the south side. Large sliding doors are provided in both ends. Sheds of this type are permanent and are of value during the entire winter. The east door may be left open, so that the sheep may enter or leave the shed at will. A shed of this type is shown in figure 6. Other types of sheds are open, facing either the east or south; while others are partly open and partly closed, and one popular type has a skeleton roof open to the east or south, which is covered with canvas when the shed is in use. Many successful flockmasters house their flocks in tent houses or in straw sheds. When properly made, these are entirely satisfactory, and if the necessary care is given a high percentage of lambs is saved.

There is a too common tendency to make sheds too warm, too dark, and too poorly ventilated. Dryness, sunlight, and good ventilation without drafts are essential to the comfort of the flock. Where sheds are built with insufficient ventilation, catarrh, pneumonia, and other similar ailments are common.

A typical interior arrangement of sheds extending east and west and 20 feet wide is as follows: On the north side there are large pens, 13 feet wide and from 15 to 25 feet long. The side of the shed forms one side of these pens, and panels form the other sides. Partitions between the pens are made in the form of hayracks or combination hay and grain racks, so that the ends of the pens contain the feed. Water troughs are also provided. On the south side of the shed there is a row of small individual pens. These commonly are made of panels 4 feet long and 3 feet high, two of which are hinged together so as to form a half pen. These two, placed in a corner of the shed, make a complete pen 4 feet square. Additional individual pens adjoining these are made by the use of similar hinged panels provided with hooks for setting up and taking down easily. When not in use the panels are folded together and piled in one corner of the shed. Some of the large pens on the north side are used by the ewes which are within a week of lambing, and others are occupied by ewes with lambs a few days old. Just before or immediately after lambing the ewe is placed in one of the individual pens and kept there until the lamb is 2 or 3 days old. Another common arrangement is to have the entire shed filled with these individual pens. This is undoubtedly a good arrangement, but it entails

more labor in feeding than the one here described, so that it seems preferable to keep some of the ewes in larger pens. In all well-planned sheds a room is provided in one end for the shepherd. A stove is placed in this room, so as to keep the room warm during the lambing season.

Racks and troughs.—There are two common types of hayracks. One is a V-shaped rack made of 1 by 4 inch pieces alternating at the base or 1 by 2 inch pieces 4 inches apart. By the use of a 10-inch board for the base these racks are often made into a combination grain and hay rack, as illustrated in figure 7. The base also catches much of the chaff and the leaves that break off from the hay. An objection to this type of rack is that some of the chaff falling from above gets into the sheep's wool. This objection can be overcome largely by the use of 1 by 12 inch boards put together lengthwise over the upper part of the rack. Another objection to the combination rack and trough is that the troughs are not usually kept clean. The other popular type of rack is a long, rectangular one, 2 feet wide and 2½ feet high. The baseboards are 16 inches high. Above these is an 8-inch space through which the sheep insert their heads, and above this is a 6-inch board. If desired, a bottom is easily provided. This type of rack is used commonly for feeding chopped hay, although the self-feeder type is becoming popular. For the best results separate grain troughs are provided. The sheltered board-bottom trough, swinging on bolts in a frame so it can be turned and cleaned easily, is very satisfactory. When it is desired to feed the lambs by themselves, creeps can be provided to admit them to the troughs while excluding the ewes. There is a wide choice of types of water troughs. The chief consideration in this connection is that the trough be so arranged that the water can be kept clean.

DISEASES, PESTS, AND MINOR AILMENTS.

There is unfortunately a common belief that little can be done for a sheep that becomes sick or unthrifty. In many cases, particularly in pure-bred flocks and in well-managed range bands, the fallacy of this belief has been shown. The flockmaster should not hesitate to secure the services of a competent veterinarian at the first indications of unthriftiness or disease. A brief discussion of pests, diseases, and minor ailments which have been found or may occur on the Minidoka project is given below.

Dogs and coyotes.—On farms near the open range the coyote is still a menace. On these farms and near the towns the dog also does considerable damage. For some reason the Idaho flockmaster has been loath to believe that dogs kill sheep, coyotes commonly being blamed for the work of dogs. So long as dogs are allowed to run at large and while coyotes are as prevalent as at present, some

kind of protection must be provided for the sheep. High fences which are proof against coyotes or dogs furnish effective protection. In some parts of the project it is necessary to confine the flock in a good corral during the night. It is important that present and prospective sheep growers have clearly in mind the possibility of damage by dogs. In certain sections of the United States the damage from this source has become serious, and it is therefore recommended that irrigation farmers provide ample protection for their sheep.

External parasites.—The common external parasites of sheep are lice, ticks, and the scab mite. Of the three, the scab mite is the most important. This mite burrows under the skin of the sheep and causes the formation of scabs. Suspected cases should be reported to the State or Federal inspectors, who will examine the sheep and if scab is present superintend the dipping.[1] The sheep louse is rarely found on the Minidoka project, but ticks are very numerous. By sucking the blood of the sheep, these pests reduce the animal's vitality, interfere seriously with the thriftiness of the flock, and retard the growth of lambs. In view of the serious damage caused by these parasites, it is surprising to note that on many farms the flocks are allowed to go unprotected year after year. Some of the farms are now equipped with dipping vats, made of wood, galvanized iron, or concrete, in which the flock may be dipped. These vats are 16 inches wide at the bottom, 24 inches wide at the top, 4 feet deep, and 5 feet long at the bottom and 10 feet long at the top, with an inclined bottom at one end. Any of the standard sheep dips used according to directions will destroy both lice and ticks. It is best to dip the flock just after shearing. If any sheep are added to the flock during the summer or if the presence of ticks is noticed, the flock should be dipped again in the fall, as the ticks increase rapidly during the winter.

Internal parasites.—Important internal parasites are stomach worms and small and large tapeworms. Although the stomach worm has not been reported on the project, it is believed that its absence is due merely to the fact that it has not yet been introduced and not to any local conditions unfavorable to the worm. In some sections of southern Idaho stomach worms are becoming common. A satisfactory method of treatment for this parasite is to drench the sheep with a solution made by dissolving 1 pound of copper sulphate (blue vitriol) in 10 gallons of water, 1 dram of the copper sulphate being sufficient to treat one sheep. Gasoline, administered in doses of from 1 to 3 drams in linseed oil or milk, is another effective remedy in general use. To be effective, these treatments

[1] A detailed discussion of sheep scab is given in United States Department of Agriculture Farmers' Bulletin 713, entitled "Sheep Scab."

must be repeated. The appearance of stomach worms sometimes can be prevented to some extent by the use of copperas or turpentine, which may be fed with salt. Equal weights of copperas and salt may be used, or the salt may be saturated with turpentine.

The small tapeworm [1] is at present the most serious internal parasite on the project. This worm is usually found to be 4 or 5 inches in length, although a few reach a length of 6 inches. Usually it produces no bad effect until the sheep are changed from green feed to dry feed in the fall. At this time the worms enter the sheep's bile duct and cause death. While the worms are still in the intestines the same treatments that are valuable in expelling stomach worms are effective in expelling the small tapeworm, but no known treatment is effective after the tapeworms enter the bile duct. The life history of this parasite is not well understood. So far, the worm has been found on the project only in those flocks that have been kept on certain summer ranges.

The large tapeworm [2] is not common on the project. Where this worm is present it is easily removed from the mature sheep through the administration of a dose of 2 drams of extract of male shield-fern in half a cup of milk. Lambs are given somewhat smaller doses. The treatment is followed two hours later by a dose of castor oil.

Foot-rot.—Fortunately foot-rot has been extremely rare on the project. So far as known, it has not occurred where the yards used in winter have been kept dry and clean and where the sheep have not been grazed in wet pastures in summer. A remedy which is popular in Idaho consists of the application to the affected parts every four days of a solution of 1 pound of copper sulphate in 1 gallon of vinegar.

Digestive disorders.—The three principal digestive disorders among sheep on the project are scours, constipation, and bloat. Sheep frequently suffer from scours shortly after they are turned on fields to clean up beet tops. The difficulty may be prevented if the sheep are given some feed in addition to the beet tops. This feed may be hay, or it may be provided through giving the sheep access to stubble fields in connection with the beet-top pasture. Some farmers overcome the difficulty by pasturing the sheep in other fields and hauling the beet tops to them. This practice is not common, however, because of its labor requirements. The remedy usually applied is a teaspoonful of ginger in a cup of warm water. In severe cases, the remedy is 1 teaspoonful of laudanum administered in milk to mature sheep and somewhat smaller doses for lambs. Constipation ordinarily occurs among the older, broken-mouthed sheep in the winter in the flocks which are fed hay alone. A dose of Epsom salts or castor

[1] *Tacnia fimbriata.* [2] *Taenia expansia.*

oil, followed by a change of feed, is the only remedy that has been found generally effective. Bloat occurs rather commonly. One of the best remedies is to administer from a pint to a quart of cows' milk, freshly drawn and warm. A half-pint of warm, sweet cream has also proved effective, as have the common remedies used in cases of bloat in cattle. Tapping should be attempted only as a last resort, as it is seldom that an animal so treated thrives afterwards.

Miscellaneous ailments.—There are a number of miscellaneous ailments which cause some damage. Catarrh, or "sniffles," is common among the open-wooled breeds when the animals are exposed to the rains. It is also common in flocks that are kept in warm, poorly ventilated stables or that are forced to sleep in snow or in wet, muddy yards. Garget, or caked udder, is usually caused by the congestion of milk in the udder, but it may result from chilling, from bruising the udder, or from improper feeding. There is also a contagious form, which, however, has never appeared on the project. If the udder is carefully attended to before lambing time and again when the lambs are weaned, garget seldom occurs. Effective remedies to use are bathing the udder with water as hot as the hand can bear, massage, and applying a mixture of lard and turpentine.

Lip and leg ulceration is occasionally brought in from the outside. By prompt treatment and rigid quarantine, it so far has been prevented from becoming widespread in this section. Usually the attention is first attracted by lameness or perhaps by scabs on the nose and lips of the affected animal, from which a greenish pus is exuded. This gets on the ground and feed and in the water troughs and thus spreads the infection throughout the flock. Affected animals lose flesh rapidly, and if treatment is not given heavy losses may result. It is necessary to resort to hand dressing, in which the scabs are removed and the affected parts treated with a solution of nitric acid, 1 part of the acid to from 5 to 9 parts of water.

One other difficulty which occasionally occurs is gravel stones (calculi). This difficulty usually occurs in rams and wethers that are ranged on beet tops or fed beets or mangels heavily. Ewes are not so affected. As no effective remedy is known, it is best, in feeding male sheep, to restrict the quantities of the feeds mentioned.

Broken pasterns and crippled or deformed feet are commonly caused by allowing the hoofs to become overgrown. This can be prevented by trimming the hoofs once or twice a year. Pruning shears or a sharp knife may be used for this work.

SHEARING.

The month of May is the popular time for shearing the farm flock. Earlier shearing permits the fleece to make such a growth by July and August that the thrift of the animals during these warm

months is interfered with. If shearing is delayed later than May, the sheep may shed a part of the wool and the fleece become ragged. When shearing, a clean floor should be provided. The wool should be clipped off close to the body, and as smoothly as possible, all the fleece being kept in one piece. The tag wool should then be removed and the fleece neatly rolled with the flesh side out and tied with paper twine. It is advantageous to sack the wool of the rams and black sheep separately. The tag wool should be sacked separately and labeled.[1] In some of the long-wool flocks, where lambs have come early and the shearing is done late, the lambs are sheared. This undoubtedly is advantageous to the lambs, as they are thriftier, more active, and attain greater size. The practice, however, has a disadvantage at the time the lambs are sold, as, because of the appearance of the wool, the buyer is likely to mistake the lambs for yearlings and quote prices accordingly. After the shearing is completed, the sheep should be dipped if lice or ticks are present in the flock.

MARKETING.

Marketing lambs.—The first early lambs that have received good care are marketed late in May or in June. Practically all are shipped to the large markets of the Middle West, chiefly Omaha. The freight rate from the Minidoka project to Omaha is 68 cents per hundredweight on a minimum of 23,000 pounds to the double-deck car.

Marketing methods have not yet become well established. There is some informal cooperative shipping in a few districts where carload lots occasionally are sent to market by groups of neighboring farmers. This is a practice that could well be increased, as marketing from the small bands is sometimes difficult. If sold before other shipments from farms or from the ranges arrive, small numbers of lambs must be held by the buyer until a full carload has been secured. This is an expensive system and results in a wide variation in price, even for lambs of the same market type. Shipments of farm lambs usually are made in connection with shipments from the ranges. Table III shows the number of cars of sheep and lambs shipped from the project each month from May 1 to December 31, 1916. Included in these shipments, approximately 5,500 head of lambs were marketed from the farms.

Marketing wool.—As there is no wool exchange or other public market on the project, each individual owner ordinarily attends to the marketing of his own wool. By shearing time most of the range sheep have been taken to the ranges. The clip from a large number of

[1] Useful detailed information regarding shearing, classing, and marketing wool has been given by Marshall and Heller. (Marshall, F. R., and Heller, L. L. The woolgrower and the wool trade. U. S. Dept. Agr. Bul. 206, 32 pp., 1 fig., 11 pls. 1915.)

these is pooled and sold cooperatively. As yet the owners of small farm flocks have not adopted the cooperative method, but sell independently to a local or a traveling buyer. As a shipment of wool bought from a large number of men varies greatly as to the grade and quality, as well as to the methods of classifying and packing, the price must necessarily be lower than if uniform systems of shearing, grading, classifying, and tying were used and the combined clips from the different farms pooled and sold together. Wool is bought in the field at any time from February until after shearing. Table IV shows the prices received for a number of representative carload shipments of wool loaded at project points in 1915 and 1916.

TABLE III.—*Shipments of sheep and lambs from the Minidoka Reclamation Project from May 1 to December 31, 1916.*

Month.	Number of cars.	Range in weight.	Average weight.	Prices f. o. b. project points.
		Pounds.	*Pounds.*	*Per cwt.*
May	4	60 to 74	68	$9.00 to $9.50
June	8	64 to 108	77	6.50 to 9.00
July	13	60 to 95	68	7.50 to 8.25
August	13	50 to 90	74	7.00 to 8.50
September	70	65 to 105	93	7.00 to 7.75
October	22	70 to 98	90	6.00 to 8.50
November	35	68 to 97	82	8.00 to 9.25
December	60	74 to 107	84	8.00 to 9.50
Total	225	50 to 108	.....	6.00 to 9.50

TABLE IV.—*Range of prices received for representative shipments of wool on the Minidoka Reclamation Project in 1915 and 1916.*

Month.	1915		1916	
	Number of cars.	Prices per pound.	Number of cars.	Prices per pound.
		Cents.		*Cents.*
April	2	23 to 24	3	28 to 29
May	5	17 to 24¾	1	25 to 30
June	3	22½ to 26	2	28 to 32

There is need for much improvement in the methods now practiced in marketing both lambs and wool, and it is expected that numerous improvements will be made as the industry develops.

FUTURE DEVELOPMENT OF THE INDUSTRY.

Judging by the demand for information regarding the problems of sheep production on the Minidoka project during the past year, it is probable that the industry will experience a marked expansion. Many farmers who formerly were apathetic have become interested and are seeking information. All the factors influencing the extension of the farm sheep industry on the project are favorable. The farmers

are becoming increasingly interested and better informed; the climatic and agricultural conditions furnish excellent opportunities for sheep production, and there is every reason to believe that prices for both mutton and wool will continue to be high. In developing the industry it is important to keep in mind the relationship of sheep production to the other industries of the farm and to the range sheep industry. It is desirable that conservative methods be followed. The importance of community action should not be overlooked, and serious efforts should be made to stabilize the industry.

CONSERVATIVE PRACTICES.

For the man who is inexperienced in sheep husbandry it is undoubtedly desirable that the start should be made in a small way and with grade ewes. If he desires, he can later work gradually into pure-breds. In this way the common mistakes of the beginner are made with relatively inexpensive grade sheep, and by the time the pure-breds are secured the requirements of good care and management can have been learned. The most successful breeders of pure-bred sheep at present are for the most part those who gained their early experience with bands of grades or with range sheep. The success of the registered flock will depend entirely upon the owner. Before securing pure-bred stock the flockmaster should be prepared to give the flock every advantage. By the time the necessary experience and knowledge have been gained through handling a flock of grade sheep the shepherd will have learned whether or not the work is to his liking and whether he will be willing to devote the care and attention necessary to success with pure-breds. Such procedure requires time, but it seems to be the only safe method to follow.

RELATIONSHIP OF SHEEP PRODUCTION TO OTHER INDUSTRIES.

There are but few farms on the project where a small flock of sheep can not be kept with profit. It is believed that the absence of sheep from many farms is due to ignorance of the farm owners regarding the possibilities of sheep production. Another reason is a lack of definite knowledge of the lore of sheep husbandry. It must be admitted that some men can never make a success with sheep. It is questionable whether the hasty, impatient, quick-tempered, or careless man can succeed in any live-stock industry, particularly with sheep or dairy cattle; but to the man who has an inherent interest in farm animals and to whom it is a pleasure to see stock kept thrifty, comfortable, and contented, the small farm flock of sheep is a source of both profit and pleasure. The production of such flocks fits in well with the other industries of the irrigated farm in this section, as already has been pointed out. It is necessary, however, for the farmer to adjust his sheep-production activities to his other farming operations,

so that his farm will not become overstocked on the one hand or his sheep receive too little attention on the other. The proper relationship of sheep production to other industries on the farm can be developed only with practical experience, and this is best gained through the patient practice of conservative methods. It is important, also, that the sheep grower keep in mind his relationship to the more extensive sheep producer who makes use of the range lands. Possibilities of mutually profitable cooperation between these two classes of producers already have been pointed out.

COMMUNITY COOPERATION.

During the last few years the demand for sheep and wool has been so strong as to make it appear that community cooperation in the various enterprises of sheep production is not necessary. Perhaps this explains the absence of extensive cooperative activities in sheep production on the Minidoka project. It has been noted in other sections of Idaho, however, that sheep growers are cooperating in both production and marketing and that the results are more satisfactory than those secured by farmers on the Minidoka project. There are good opportunities for community cooperation in such matters as securing breeding stock, purchasing supplies, marketing wool and mutton, and the general dissemination of useful information. The importance of cooperation in these matters will be increasingly apparent as farm sheep production in the western United States increases, and it would be advantageous for communities already engaged in the industry to begin early to develop cooperative relationships.

STABILIZING THE INDUSTRY.

It has been pointed out repeatedly that the development of satisfactory methods of management requires experience. The successful establishment of farm sheep production is possible only through the persistent application of the best methods of management. The experience of the farmers on the Minidoka project during the last five years has shown clearly the undesirability of getting into or out of the sheep business suddenly because of market fluctuations. The men who have remained in the business are demonstrating that the industry will be permanent on most farms. On almost half the farms the care, attention, and general methods of management are far above the average for other sections of southern Idaho and are of a character which insures success. The natural advantages of the high altitude, the dry climate, the many clear days, the abundance of irrigated pasture with other cheap feeds, and the short winter feeding period are all favorable to the development of the industry. Good care, a study of the habits of the flock, and an earnest effort to satisfy

its natural requirements, together with a desire to keep the animals in a thrifty and contented condition, are bringing success to many men whose problems and methods have been investigated. When all the facts are considered, including the local and general economic conditions, it seems certain that, if properly carried on, sheep production on the farms of the Minidoka project is potentially one of the most profitable agricultural industries. The extent to which the industry will realize its possibilities will depend very largely upon the exercise of persistent endeavor, through which the necessary stability can be secured.

ADDITIONAL COPIES
OF THIS PUBLICATION MAY BE PROCURED FROM
THE SUPERINTENDENT OF DOCUMENTS
GOVERNMENT PRINTING OFFICE
WASHINGTON, D. C.
AT
5 CENTS PER COPY.

WASHINGTON : GOVERNMENT PRINTING OFFICE : 1917